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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,309

06/09/2005

Gregson William Martin Spring

SGW-3

4247

7590

05/14/2007

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EXAMINER

DANG, HUNG Q

ART UNIT

PAPER NUMBER

2612

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,309	SPRING, GREGSON WILLIAM MARTIN	
	Examiner	Art Unit	
	Hung Q. Dang	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) ✓ | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) ✓ | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09 June 2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to application's preliminary amendment dated 6/9/2005.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 15** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 claims an "electrical signal comprises a coding means...", which does not make any sense. The claim subject matter is not clearly and distinctly pointed out.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicholson Leon WO 02/12676 in view of Lerner et al. U.S. Patent 5,517,464.

Note: downhole alternators are used to generate electrical power for downhole drilling instrumentation. Downhole alternators derive their primary power from a mud turbine, which rotates in response to the linear flow of the mud down the centre of the

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drill string. All mud alternators effectively run open loop. This means that the output voltage of the mud alternator is entirely dependant on the mud flow rate and is zero when there is no mud flow and at a maximum when the mud flow is at its maximum. This highly variable output voltage characteristic is completely unsuitable for drilling instrumentations. This is why there has been a desire for a control means for regulating the rotation of the alternator to achieved desired rotation.

Regarding claims 1, 9 and 10, Nicholson teaches a communication system for downhole use comprising a drill collar (page 17, lines 4-10; unit 23 is a drill collar), which comprises a first portion (Figure 4A, unit 34) and a second portion (Figure 4A, unit 47) separated from each other by an electrically insulating material (Figure 4A, unit 39) and means (Figure 4A, alternator 43; page 17 lines 21-28) for generating an electrical signal and for applying the electrical signal to the drill collar such that the electrical signal is transmitted into a geological formation being drilled (page 20, lines 17-26), wherein means for generating the electrical signal comprises an alternator (Figure 4A, unit 43).

However, Nicholson does not teach means mechanically connected to the alternator being responsive to an electrical output of the alternator for regulating rotation of the alternator.

Lerner et al., in the same field of endeavor, teaches a turbine generator for generating power to downhole tools, which comprises an alternator for generating downhole power. Said alternator is also connected to a feedback control circuit and

other electrical components to control the speed of the rotation of the alternator (column 3, lines 35-63 and column 8 lines 31-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide such means connected to the alternator disclosed by Nicholson, as evidenced by Lerner et al., so that the speed of the rotation of said alternator can be controlled.

Regarding claims 9 and 10, clearly, if the rotation of the alternator speed is constantly maintained, then the output voltage and frequency signal from the alternator would be constant.

Regarding claim 2, the means responsive to the electrical output of the alternator disclosed by Lerner et al. also comprises a torque generating apparatus (column 8, lines 31-63; the "feedback control circuit" control the generation of torque in response to the electrical output of the generator), which generates torque in response to the electrical output of the alternator and transmit such torque to the alternator for regulating rotation thereof.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide such means to the system disclosed by Nicholson, as evidenced by Lerner et al., so the rotation of said alternator can be regulated.

Regarding claims 3 and 4, the claimed subject matter of claim 3 is merely the conventional structure of a torque generation apparatus. The first assembly is a rotor; the second assembly is stator. Column 8 lines 4-30 of Lerner et al. shows the claimed

limitation of claim 3. Therefore, it would have been obvious to one of ordinary skill in the art to provide such torque generation apparatus to the system disclosed by Nicholson, as evidenced by Lerner et al., in order to control the rotation of the downhole alternator.

Regarding claims 5 and 6, Lerner et al. also teaches a rectification means (diodes 88) for converting the electrical output from the alternator to provide DC current to the electromagnetic winding of the torque generating apparatus to generate an electromagnetic braking effect (column 9 lines 15-24 and 45-52).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide a rectification means to the system disclosed by Nicholson in view of Lerner et al. in order to generate an electromagnetic braking effect to control the speed of the rotation of said alternator.

Regarding claim 7, Lerner et al. also teaches progressive braking effect. Column 6, line 55 to column 7, line 35 shows the different parameters involved with the braking effect. One skilled in the art would recognize that by varying the parameters in the indicated equations would progressively change the braking effect. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide progressive braking effect to the alternator voltage regulation means disclosed by Nicholson in view of Lerner et al., as evidenced by Lerner et al.

Regarding claim 8, the alternator voltage regulation means disclosed by Lerner et al. also functions to effect braking at a predetermined set point (column 9, lines 45-53; the "braking intervals 212, 214, 216" are predetermined set points).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide predetermined set point to the braking function of the system disclosed by Nicholson in view of Lerner et al., as evidenced by Lerner et al., so that the rotation of the alternator can be braked according to a predetermined set point.

Regarding claims 11 and 14, Lerner et al. also teaches a switch (Figure 4, unit 36; and column 8 lines 31-33) provided for applying an electrical signal to the drill collar. Therefore, it would have been obvious to one of ordinary skill in the art to provide a switch to the system disclosed by Nicholson in view of Lerner et al. so that the desired speed of the alternator can be controlled. Column 8 lines 31-33 shows a microprocessor provided to control the at least one switch.

Regarding claims 12-13, the examiner takes official notice that semiconductor and electromechanical switches have been commonly known and used in electrical devices. Therefore, by conventionality, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide such switches to the system disclosed by Nicholson in view of Lerner et al.

Regarding claim 15, as best interpreted by the examiner, claim 15 claims a coding means for transmitting data to a receiving means at a region outside the geological formation. Nicholson also teaches coding means for transmitting data to a receiving means at a region outside the geological formation (page 20, lines 27-31).

Regarding claim 16, Lerner et al. discloses the conventionality of using the claimed coding methods (column 7, lines 58-67). By conventionality, it would have

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been obvious to one of ordinary skill in the art to provide such coding method to the system disclosed by Nicholson in view of Lerner et al. to transmit data.

Regarding claims 17-19, the examiner takes official notice that amplifier, timing means, microprocessor for various purposes such as processing the received signals, amplify the received signals to transmit to another remote receiver and a timing means can be used to synchronize transmit/receive signals. Therefore, it would have been obvious to one of ordinary skill in the art to provide such components to the receiving means disclosed by Nicholson in view of Lerner et al. to achieve the purposes indicated above.

Regarding claim 20, Nicholson also teaches a transformer for altering the impedance of electrical signal (page 20, lines 17-26).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Q. Dang whose telephone number is (571) 272-3069. The examiner can normally be reached on 9:30AM-6PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Wu can be reached on (571) 272-2964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hung Q Dang
5/7/2007
H.D.

HD


BRIAN ZIMMERMAN
PRIMARY EXAMINER